

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: GANDEL; Pierre

SERIAL NO.: 10/505,246

ART UNIT: 2834

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EXAMINER: Preston, E.D.

TITLE: LINEAR ACTUATOR COMPRISING A BRUSHLESS POLYPHASE ELECTRIC
MOTOR

Amendment B: REMARKS

Upon entry of the present amendments, previous Claims 14 - 24 have been canceled and new Claims 25 - 35 substituted therefor. Reconsideration of the rejections, in light of the forgoing amendments and present remarks, is respectfully requested. The present amendments have been entered for the purpose of more clearly distinguishing the present invention from the prior art.

In the Office Action, it was indicated that Claims 14, 15, 18 - 20, 23 and 24 were rejected under 35 U.S.C. § 103(a) as being obvious over the Hewette patent in view of the Huber patent and further in view of the Kobayashi patent. Claims 16 and 17 were rejected as being obvious over the Hewette patent in view of the Huber patent in view of the Kobayashi patent and further in view of the Sieber patent. Claim 21 was rejected under 35 § U.S.C. 103(a) as being unpatentable over the Hewette patent in view of the Huber patent in view of the Kobayashi patent and further in view of the Lamb patent. Claim 22 was indicated to as "objected to" as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As an overview to the present reply, Applicant has amended previous Claims 14 - 24 in the form of new Claims 25 - 35. New independent Claim 25 reflects the limitations of previous

independent Claim 14. New independent Claim 25 indicates that the electric motor is "reversible" and that the restoring means acts at least partially "directly onto" the control organ so as to restore the control organ via the driving means into the retracted position. Applicant respectfully contends that these features serve to distinguish the present invention from the prior art combination.

Generally, Applicant has reviewed the prior art references to Hewette, Huber and Kobayashi. Fundamentally, it is extremely difficult to see how one can combine the teachings of one of these patents with the teachings of another of these patents in order to achieve the present invention, as now claimed. Each of these prior art patents describe very complicated constructions whereby a component of one cannot be easily combined with a component of another so as to "make obvious" the present claim. Applicant respectfully contends that it is only with hindsight analysis that the various components of these three (3) prior art references can be combined, in any way, so as to show the structure of the present invention.

Relative to the Hewette patent, the Hewette patent does not show the "restoring means" as described in independent Claim 25. Applicant respectfully disagrees with the Examiner's analysis that the "restoring means" in the Hewette patent acts partially on the control organ. The Hewette patent describes a system whereby the elastic restoring system is placed directly on the motor and therefore applies a torque to this rotor before the transformation/reduction mechanism. In contrast, the present invention utilizes an elastic return system which applies a force at the shaft output on the control organ after the transformation/reduction mechanism. The means for transformation/reduction of movement must involve a reverse output in order to guarantee a force applied against the action on the motor and on the organ controlled allows the organ controlled to return to its position. As such, the new language in which the restoring means acts at least partially

"directly onto" said control organ is distinguishable from the teachings of the Hewette patent. The Hewette patent only utilizes, at most, "indirect" action onto the control organ.

This difference is rather important since the restoring means is linked to a rotor applied a spring which is functional on several turns of the rotor. However, it is well understood that this type of spring is generally difficult to make and very is very costly. The compression spring, as utilized in the present invention, is much more common and economical.

Relative to the Kobayashi patent, the compression spring that is used does not have the function of bringing the motor back to its initial position. The compression spring used in the Kobayashi patent is simply used for compensating for the mechanical clearance. This is described, in particular, in column 8 as follows:

In addition, since the rotation of the rotor 21 is transferred to the valve shaft 20 via a speed reduction mechanism, such as a screw mechanism, it is possible to precisely control this cross-sectional area of the annular airflow passage 28. Furthermore, even if some tolerance is present between the internal screw threads 47 of the hollow cylindrical inner body 40 and the external screw threads 29 of the valve shaft, since the valve shaft 20 is always biased toward the right in Fig. 2 due to the spring force of the compression spring which is inserted between the valve head 36 and the end plate 11, no play is present between the external screw threads 29 of the valve shaft 20 and the internal screw threads of the hollow cylindrical inner body.

Additionally, the Kobayashi patent concerns a motor that is not reversible. So as to distinguish the present invention from the Kobayashi patent, it is indicated that the motor of the present invention is "reversible". Even if the motor in the Kobayashi patent were reversible, the motor would have to maintain its position and fight constantly against the restoring force exerted by the spring. The Kobayashi patent does not contemplate any probes for indicating the position of the motor. Given the description of the Kobayashi patent, it is virtually impossible to imagine that such a motor could

be controlled to maintain a precise position against the action of the spring. In fact, in the Kobayashi patent, the motor is clearly non-reversible. The spring is only intended to compensate for the mechanical clearance in the movement transformation system. Additionally, nothing in the Kobayashi patent indicates that the spring acts at least partially "directly onto" the control organ, in order to bring it back to any position.

The prior art Huber patent fails to disclose any such "restoring means" which acts at least partially "directly onto" the control organ for restoring the control organ to its retracted position. As such, this feature is neither shown nor suggested in the prior art combination. Since the present invention achieves advantages not contemplated by the prior art combination in its ability to restore the control organ to its retracted position, Applicant respectfully contends that the present invention, as defined by independent Claim 25, is patentably distinguishable from this prior art combination.

Dependent Claims 26 - 35 herein correspond, respectively, to the limitations found in previous dependent Claims 15 - 24.

Based upon the foregoing analysis, Applicant contends that independent Claim 25 is now in proper condition for allowance. Additionally, those claims which are dependent upon Claim 25 should also be in condition for allowance. Reconsideration of the rejections and allowance of the claims at an early date is earnestly solicited. Since no new claims have been added above those originally paid for, no additional fee is required.

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